REPORT TO THE TWENTY-FOURTH LEGISLATURE

REGULAR SESSION OF 2007

RELATING TO THE COQUI FROG

Prepared by

THE STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF FORESTRY AND WILDLIFE

In response to Act 160, Session Laws of Hawaii 2006

Honolulu Hawaii
September 2006

RELATING TO THE COQUI FROG

PURPOSE

This annual report complies with Act 160, Session Laws of Hawaii (SLH) 2006, and describes the efforts of the Department to control and eradicate coqui frogs by County and, provides an analysis of whether the coqui infestation on the island of Hawaii can be controlled, stopped from expanding, reduced, or eradicated, and including projected timetables, projected expenditures, potential volunteer/community contributions of time and funds, and coqui population targets over time. Act 160 provided $2,000,000 in state funds from the Natural Area Reserves Fund for the purpose of controlling the coqui frog. This largely replaced funding that had been provided by the County of Hawaii and supplemented funding provided by the Hawaii Invasive Species Council to the Island Invasive Species Committees (ISCs) that have been the primary entities coordinating and carrying out statewide coqui frog control.

From Act 160 Session Laws Hawaii 2006:

(25) By adding a new section to read as follows:

"SECTION 19.5. Provided that of the special fund appropriation for natural area reserves and management (LNR 407), the sums of:

(1) $500,000 for fiscal year 2006-2007 shall be expended by the department of land and natural resources for coqui frog control and eradication on the islands of Kauai ($50,000), Oahu ($50,000), Maui ($100,000), and Hawaii ($300,000);

(2) $1,000,000 for fiscal year 2006-2007 shall be expended by August 1, 2006, as a grant to the county of Hawaii for coqui frog control and eradication; and

(3) $500,000 for fiscal year 2006-2007 shall be transferred by August 1, 2006, to the department of agriculture for coqui frog control and eradication, including research;

provided further that the department of land and natural resources, the county of Hawaii, and the department of agriculture shall each prepare a report on the above-mentioned activities, focusing on whether the coqui infestation on the island of Hawaii can be controlled, stopped from expanding, reduced, or eradicated, and including projected timetables, projected expenditures, potential volunteer/community contributions of time and funds, and coqui population targets over time; and provided further that each entity shall submit its report to the legislature no later than twenty days prior to the convening of the 2007 regular session."

BACKGROUND

The coqui frog, *Eleutherodactylus coqui*, threatens the stability of Hawaii's native forest ecosystems. High densities of the coqui frog have become a serious noise nuisance in residential and tourist areas and are also decreasing property values. Vendor and public concern over purchasing infested nursery material is impacting the floriculture and nursery products industry. The full ecological and economic impact of the frog has yet to be determined, but the severity of the invasion requires the development and implementation of a coordinated management plan as well as a clear understanding of the likely outcome of the current funding distribution.

Big Island

Most of East Hawaii is considered infested, including most Hilo, Puna, and outlying areas north of Hilo, where they reach densities over twice as high as in their native range. Small breeding populations have persisted up to 3,000 feet elevation. Isolated detections have occurred in elevations up to 4,000 feet and were probably transported by vehicles and construction equipment from infested areas. Coqui frogs have also infested sites on the west side, of Hawaii Island, including Kaloko Mauka, Captain Cook, and Manuka State Park. Coqui frogs are not considered eradicable on Hawaii Island but control efforts aim to contain their spread by treating small isolated populations. The current estimated total infested acreage is 7,000 acres or 10.94 square miles.

Kauai

Kauai County currently has only one population of coqui frogs. Located in Lawai next to Aepo Reservoir, the infestation covers approximately 15 acres. Although they were introduced in the year 2000, the frogs were not reported for at least two years. Upon survey, the population was found to be well established in a heavily forested gulch comprised of hau and other weed species. Control work has kept this population from spreading to the surrounding areas. Detection work has also resulted in confirming that coqui were introduced to several other sites as well.

Maui

The first Maui observation of a coqui frog was made in 1997. Since that time, Maui Invasive Species Committee (MISC) has recorded reports of coqui frogs at approximately 277 sites, scattered across the island. Frogs have been reported from Hana (East Maui), Haiku and Kula (Upcountry), Kahului and Wailuku (Central Maui), Kapalua and Lahaina (West Maui) and Kihei (South Maui). In 2004, MISC estimated that coqui frog infestations covered at least 161 acres.

Oahu

The first Oahu observation of a coqui frog was made in 1998. Since that time, the Oahu Invasive Species Committee (OISC), as the coordinating entity of the Coqui Working Group (CWG) has recorded confirmed reports of coqui frogs at approximately 25 sites, scattered across the island. The Coqui Working Group (CWG) cooperators includes the state, federal and county agencies.

SUMMARY OF INTER-AGENCY TRANSFERS

The funding designated for the County of Hawaii and the Department of Agriculture by Act 160, SLH 2006, were to be expended and transferred respectively by August 1, 2006. These entities are required to report separately on their use of this funding as well as the other questions posed by the Act relating to the feasibility of controlling coqui frogs. History of funding expenditures and transfers by DLNR:

- July 20, 2006 JV J0029 Transfer $500,000 to HDOA.

- July 28, 2006 Check No. 0005452 $1,000,000 to the County Director of Finance, picked up by Mr. William Kenoi, Mayor Kim's assistant.

SUMMARY OF DEPARTMENT EXPENDITURES TO DATE

The $500,000 designated for Department expenditure by Act 160, SLH 2006, for fiscal year 2006-2007 is for coqui frog control and eradication on the islands of Kauai ($50,000), Oahu ($50,000), Maui ($100,000), and Hawaii ($300,000). A brief history of the expenditures by DLNR to date are as follow:

- 7/24/2006 PO30614 Encumbered $275,000 for Big Island coqui project including a coordinator and control operations, Coordinator hired via RCUH, start date is Oct 16, 2006.

- 09/15/06 POC31347 Encumbered $100,000 to Maui via the Maui Invasive Species Committee (MISC) for the purpose of coqui frog control

Remainder unspent as of September 25, 2006: $125,000.

EXPENDITURE PLAN FOR REMAINING FUNDS

The funds for Kauai and Oahu will be encumbered in the second quarter of the fiscal year 2006-2007. The planned expenditures and required actions are as follow:

- Kauai - Finalizing plan for control actions, once the plan is approved and signed a PO will be used to encumber $50,000 to the Kauai ISC by the end of October.

- Oahu – The work plan has been approved and is being routed for signatures, PO will be used to encumber $50,000 to OISC by mid-October.

- Hawaii – The remaining $25,000 will be used to support project management by Hilo branch and encumbered directly from DOFAW for the purchase of tanks and a vehicle for the coordinator.

DLNR PLANNED COQUI FROG CONTROL ACTIVITES

Big Island

The goal for the Big Island is control of outlying populations of coqui frogs, improving communication and data sharing, and community support.

It is not feasible to control or contain existing populations of coqui frogs with the existing resources. The Department has decided to focus on continuing to maintain all coqui data for the county, facilitating communication and providing community support to the extent possible. Towards this end, the Department has hired a Coqui Frog Coordinator who will be based in Hilo and report on expenditures to the Legislature as well as revising and disseminating the statewide, "Hawaii's Coqui Frog Management, Research, and Education Plan." The funding will also support the efforts of the Big Island Natural Area Reserves crew who have developed an aerial application technique for citric acid that has been used for the past year at Manuka State Park. This may be expanded to treat additional outlying populations of the coqui that will slow their spread. The Big Island ISC (BIISC) will also supply a field crew and has housed the complete database of coqui frog past and current population locations, treatments and agency resources.

Kauai

The goal for Kauai is island wide eradication.

Kauai County currently has only one population of coqui frogs. Located in Lawai next to Aepo Reservoir, the infestation covers approximately 15 acres. From 2002 to 2005 control work continued at this site utilizing a partnership between Hawaii Department of Agriculture and Kauai Invasive Species Committee. With extensive habitat modification and cooperation from the land owners, current treatment efforts are reducing the population of coqui. The goal of no calling frogs by the end of the summer in 2007 with monitoring through out 2008 is on schedule. Detection work has also resulted in confirming that coqui were introduced to several other sites as well. Island wide community awareness, survey and work with nurseries on detecting coqui frogs will continue indefinitely as reestablishment from Hawaii populations is likely

Maui

The goal for Maui is containment of the existing large population of coqui frogs at Maliko with eradication to be attempted if additional resources are made available.

With increased funding from the State of Hawaii and Maui County, Maui ISC (MISC) hired a four-person crew to focus on coqui frogs beginning in spring 2005. MISC had eradicated one population center located in Haiku. Remaining active populations now cover an estimated 150 acres, down from the 2004 estimate of 161 acres. Field observations suggest that frog densities have been significantly reduced at many of the population sites, with the caveat that frogs may be less vocal during the colder winter

months. With ongoing effort, MISC believes that at least four of the remaining populations will be in "monitor" phase by next fall with all but the largest following suit by the fall of 2007. Sites placed on monitor status continue to be visited on a regular schedule for at least one year after the last vocalizing male has been heard. Sites identified as "Revolving Sites" include several plant providers where single frogs are continually reported after new shipments arrive from the Big Island.

Oahu

The goal for Oahu is island wide eradication.

With increased funding in 2005, Oahu ISC (OISC) was able for the first time to allocate the necessary resources towards coqui eradication and this effort will be continued with the elimination of all known calling frogs by the end of the summer of 2007. The systematic night sprays of the 10-acre Wahiawa population with citric acid seemed to be greatly effective in reducing the population from over 130+ calling frogs in 2004 to no calling frogs by the end of the calling season in 2006. This site will continue to be monitored. In addition, in 2005 there were four active nurseries with varying population levels, ranging from a few frogs to several dozen or possibly hundred(s) of calling frogs. In 2006, this has been reduced to one. Two populations at retail stores (store on a military base and Home Depot) have been eradicated. A protocol for controlling frogs and efforts to assist business owners in receiving NRCS support has been developed. The CWG has been working with the nursery owners to systematically monitor and control all the coqui populations in the nurseries. This will continue indefinitely as reestablishment from Hawaii populations is likely.

IMPACT OF PROJECTED COQUI FROG CONTROL ACTIVITES

In addition to funding coqui frog control activities, Act 160, SLH 2006 requires that the Department report on whether or not the, "coqui infestation on the island of Hawaii can be controlled, stopped from expanding, reduced, or eradicated, and including projected timetables, projected expenditures, potential volunteer/community contributions of time and funds, and coqui population targets over time."

Because of the scope of this effort and the number of agencies currently involved in this effort, a more complete evaluation of the required effort has been developed in, "Hawaii's Coqui Frog Management, Research, and Education Plan." A copy of this document is included as Attachment 1. An excerpt from the executive summary is included below.

MANAGEMENT GOALS WITH SELECTED ALTERNATIVES

Statewide
The preferred alternative would be to restrict the spread of frogs into new habitats, eradicate small discrete populations in high-value natural areas, and eradicate frogs from the islands of Oahu and Kauai. These management efforts should be combined with increased public education and outreach for all islands. To reduce the spread of frogs, detection activities should increase statewide, quarantine systems should be established that minimize the risk to intrastate and via out-of-state exports, and effective protocols should be enacted for movement of materials among islands. Local communities and businesses who are actively suppressing local coqui populations should be supported. All information on the distribution of frogs and the efficacy of control efforts should be centrally maintained.

Oahu
The alternative for increased control would ensure that current progress on eradication of all known populations of coqui frogs is maintained as well as ensuring that no new populations become established. Increased public education would result in improved reporting and subsequently more effective response to new populations.

Big Island
Even if no additional resources are made available efforts to maintain information on the distribution of coqui and the efficacy of control efforts should be improved. Establishing more effective protocols to prevent spread of frogs intra-island will result in preventing the costs associated with mitigation and control for other Counties. Efforts should be made to eradicate or contain frogs in geographically-defined areas on the Big Island, including outlying populations, high-value natural areas, and sites that would facilitate further distribution. Continuing support to local communities and businesses who are actively suppressing local coqui populations by providing education, training and material support is a priority.

Kauai
The alternative for increased control would ensure that current progress on eradication of all known populations of coqui frogs is maintained as well as ensuring that no new populations become established. Increased public education would result in improved reporting and subsequently more effective response to new populations.

Maui
The alternative for increased control would ensure that current progress on eradication at most known smaller population centers of coqui frogs is maintained. Containing the Maliko Gulch population and work toward eventual eradication is preferred but unlikely to succeed with current resource levels. Increased public education would result in improved reporting and subsequently more effective response to new populations. Adding additional inspectors may be possible with the new HDOA Biosecurity initiative which could provide adequate inspection of incoming plant materials for Molokai and Lanai.

RESEARCH GOALS WITH SELECTED ALTERNATIVES

Control
Current chemical control methods may be used in agriculture, private lands, and natural areas. Additional chemical control methods could be developed to target frogs in natural areas or to be used in quarantine areas for sensitive plants. Barriers and hot water methods may be useful in quarantine areas or greenhouses and development of effective methods seems likely. State funding should be centralized with HISC so duplication of effort and research into unproductive areas is minimized. HISC's process of providing research funds is well established and ensures peer review of research endeavors. Since funding was reduced from $4,000,000 in 2005 and 2006 to $2,000,000 in fiscal year 2007 it is not clear if there will be continued support for the HISC research program. Funds provided to HDOA and other entities should follow a similar framework to ensure high quality research.

Effects of Frogs
Increased state funding should be directed to research on the economic effects of frogs to document the impact and reveal areas of concern. Funding for the effects of control efforts should be a high priority to ensure that goals for each island are being met.

EDUCATION AND OUTREACH WITH SELECTED ALTERNATIVES

Education and Outreach activities should be increased state-wide to present a unified and comprehensive focus on this pest. This will require additional resources to increase participation and awareness. Current levels of resources are inadequate to encourage reports of new coqui locations, provide responses to calls that do come in or train community members to respond to populations of coqui in their neighborhoods. More could be done to reach the plant industry. The plant industry mailing database has recently been completed and numbers up to 3000 entries statewide. Education for homeowners/residents should continue to use the major media outlets on the island, but to

increase the frequency of the messages. Additional materials should be developed and disseminated for all relevant media, including television, newspaper, radio, and internet to educate the public about the magnitude of the coqui frog problem, how to take appropriate action, and the status of detection and control efforts. Public assistance in detecting and reporting frog locations is essential.

The incorporation of the statewide 643-PEST hotline with appropriate follow up is critical. To encourage public cooperation, reports must generate a timely and meaningful response from a central response center. This central response center for inquiries and reports from the public should field and answer questions from the public and take information about new infestations as well as inform reporters about planned activities for the area and how the reporter can help. Developing a response follow-up tracking system and central database will maintain adequate communication among cooperators.

FUNDING NEEDS AND SOURCES

Current funding levels are not sufficient to achieve statewide eradication of coqui frogs. Continued control efforts funded by state and federal sources on Kauai and Oahu will result in the likely eradication of all known populations of coqui on those islands. It is unlikely that the current resources available for surveying for coqui and providing outreach to encourage businesses and the public to report new locations of coqui are adequate to ensure the individuals and small populations are detected rapidly enough to eliminate the need for a continuing response capacity. Current state and county funding for Maui County efforts will result in a reduction in the number of populations of coqui frogs but will not fully contain the large population at Maliko Gulch. Current efforts on the Big Island may slow the spread of coqui from some isolated populations but does not address spread from large population centers, the impact of coqui to nurseries and other businesses, most new isolated populations or many of the requests from the public for assistance.

The selective alternatives that would provide for increased survey, detection and outreach efforts on Kauai and Oahu, increased control on Maui and more support for the Big Island communities. Another critical element that will reduce future costs is investment in improved interisland quarantine and interdiction and a stronger investment in research. would require additional funding over and above the current efforts from local, state and federal funding agencies. Overall, cost estimates are based on current knowledge. Prices may decrease if additional tools or methods are developed or prices may increase due to increased costs.

ATTACHMENT 1 – , “Hawaii’s Coqui Frog Management, Research, and Education Plan.”